

1. Major Findings

The 2000 Water Quality Inventory Report for New Jersey provides detailed information on the following: surface water quality status and trends, the attainment of designated uses specified in New Jersey's Surface Water Quality Standards, Special State Water Quality Concerns and Recommendations. An overview of the state's ground water quality is also included. This report was prepared pursuant to Section 305(b) of the Federal Clean Water Act and the State Water Quality Planning Act.

The New Jersey Department of Environmental Protection (NJDEP) has made significant progress in implementing environmental Results Based Management (RBM). The NJDEP Strategic Plan for New Jersey and New Jersey's National Environmental Performance Partnership System (NEPPS) agreement include environmental goals, milestones and objectives that were developed in public forums. Program strategies and activities are oriented toward meeting these goals and environmental indicators are used to measure progress.

This report addresses basic water quality questions such as: What is the overall quality of New Jersey's waters? Are New Jersey's waters swimmable? Are New Jersey's waters fishable? Answers to these latter two questions are complex and should consider how "swimmable" and "fishable" are defined, how monitoring data are collected and assessed to measure these uses, as well as the specific characteristics of the waterbody and seasonal considerations.

"Swimmable" means that the waterbody can be safely used for swimming and other recreation that includes contact with water. "Fishable" means that there is a healthy population of fish and/or shellfish in the waterbody that are safe to consume or harvest. Over time, the federal Clean Water Act definition of "fishable" has been broadened to include a healthy aquatic ecosystem. Brief responses to these questions are provided here, with additional detail in the remainder of the report.

Are New Jersey's waters "swimmable"?

Designated recreational swimming areas in oceans, bays and lakes

In the majority of cases, yes. New Jersey's 179 ocean beaches and 138 bay bathing beaches have excellent water quality. Recreational ocean and bay beaches are closely monitored in New Jersey, with 5,000 to 6,000 samples collected each summer. For ocean beaches in 1999, there were only 8 closures due to exceedences of fecal coliform standards for bathing beaches and only 6 precautionary closures due to suspected pollution events. For bay beaches in 1999, there were only 21 closures because fecal coliform standards were not met. NJDEP has developed a coastal beach milestone: *By 2005, 100% of New Jersey's coastal recreational waters will be safe for swimming.* Because each beach was open more than 90% of the time in the 100-day summer beach season, 100% of 179 ocean beaches and 100% of 138 bay beaches are considered to meet this milestone.

Statewide information for lake bathing beaches is available for the first time in this report. Based on monitoring, typically conducted weekly, many of New Jersey's 376 lake bathing beaches have excellent quality and few closures: 277 of 376 lakes (74%) met bathing beach standards at least 90% of the 1998 summer. There were 50 lake beaches that were classified as partially meeting lake recreational uses because the bathing beach standards were met between 89%

and 75% of the time. There were 27 lake beaches that met bathing beach standards less than 75% of the time and were thus classified as not meeting lake recreational uses. Data were not available on the remaining 22 recreational lake beaches. NJDEP has developed a lake beach milestone: *By 2000, lake recreational bathing beach waters will have been assessed and water quality improvement projects will have been prioritized.* For the first time, this statewide assessment is nearly completed and the results provided can now be used to prioritize pollution prevention and water quality improvement projects at recreational lake bathing beaches.

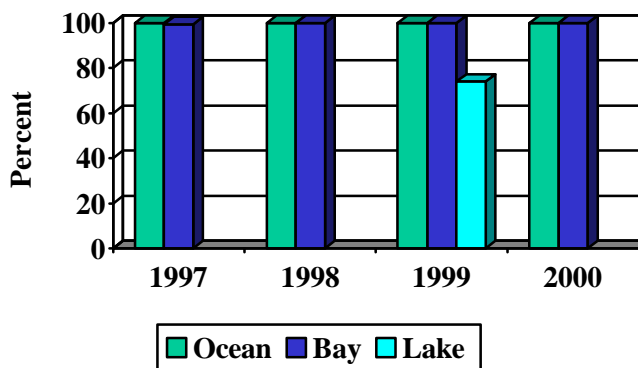
NJDEP is implementing a beach action plan for coastal beaches by working cooperatively with local beach communities and wastewater treatment plant operators to prevent the few remaining pollution incidents at coastal beaches. Watershed management will target water quality improvement and pollution prevention projects in lakes with water quality issues at recreational beaches.

Rivers

The current river monitoring program does not target locations that are used for swimming. NJDEP and watershed partners plan to explore focused monitoring of river reaches actually used for swimming. This monitoring approach will provide data to better evaluate human health risks of swimming in rivers.

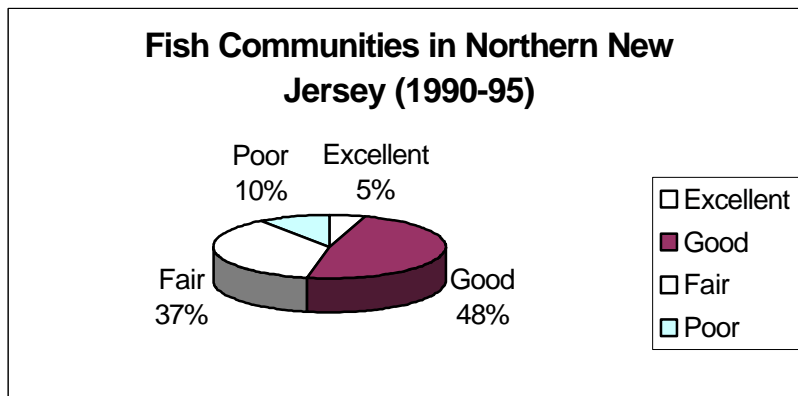
Pinelands rivers monitoring stations, including those on the Rancocas, Bass, Oswego, Great Egg Harbor and Mullica met or had better water quality than required by sanitary Surface Water Quality Standards between 1995 and 1997. Primarily because of nonpoint sources such as geese, storm drains and overland runoff, the sanitary quality of many other river monitoring locations in more urbanized areas of the state did not meet standards. Compliance with permit limits for sanitary quality of effluent at wastewater treatment plants is very high. Localized issues arise due to combined sewer overflows, failing wastewater and septic infrastructure and occasional wastewater treatment plant malfunctions. The role of livestock is also being explored. Several programs are in place to improve management of livestock waste, statewide with a special emphasis on agricultural areas in southern New Jersey.

Swimmable Index for NJ Beaches



Are New Jersey's waters fishable?

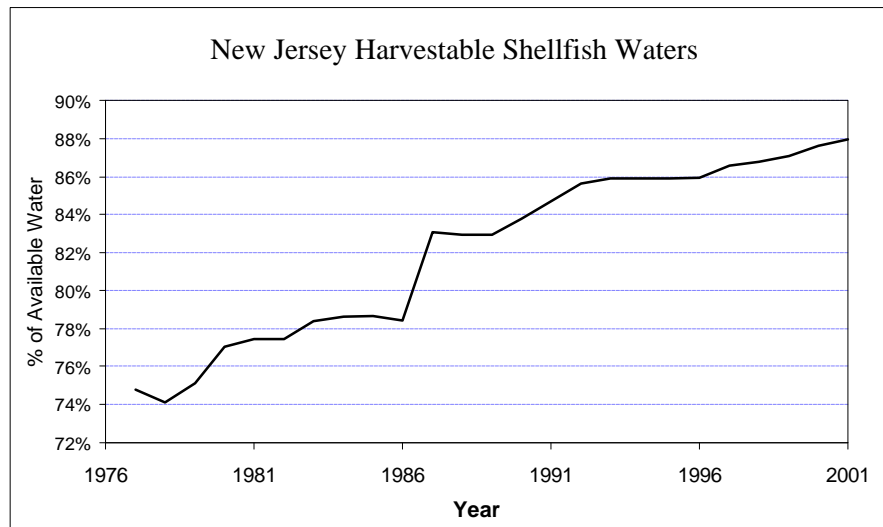
In the majority of cases, yes. In 1995, over 173 million pounds of finfish valued at more than \$95 million were commercially harvested. Major species include bluefish, mackerel, whiting, red hake, tilefish, flounder, and swordfish. New Jersey also has many high quality warm water (non-trout) fisheries including small and largemouth bass, chain pickerel, pike, walleye, perch and catfish in most waterbodies of the States.



New Jersey has streams where trout naturally reproduce and streams that support trout and trout associated species. These streams are located primarily in the hilly northern portion of the state. Due primarily to improvements in water quality as wastewater treatment plants were upgraded and regionalized,

fish communities in the Raritan and Delaware river basins improved from fair to good and in the Passaic river basin, fish communities improved from poor to fair. In addition, stream classifications were upgraded to trout maintenance or trout production in 16 stream segments over the last several years. Round Valley Reservoir continues to be one of the premier lake trout fisheries in the United States.

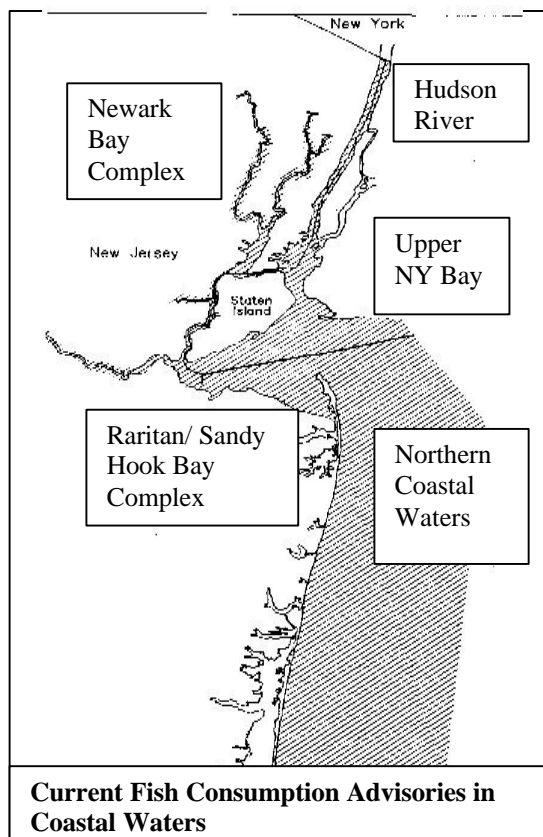
Shellfish beds available for harvest provide a good indicator of sanitary water quality. Based on 1990 data, New Jersey was one of the largest shellfish producing states in the country with estimated landings of 75 million pounds valued at over \$60 million. New Jersey has been a national leader in opening shellfish beds with 88% of shellfish beds available for harvest.



NJDEP is implementing a Shellfish Action Plan to increase this to 90% by 2005 and achieve the NEPPS milestone. New Jersey has increased shellfish waters available for harvest each year for the past 12 years and for 24 of the past 25 years.

Can fish caught in New Jersey be eaten?

Generally, yes. Important commercial and recreational species can be safely eaten by anyone, including summer and winter flounder, weakfish, smallmouth bass, perch, carp, etc. For other species, New Jersey and many other states have developed fish consumption advisories that apply to specific species, generally in specific areas. Fish consumption advisories generally limit frequency of consumption.



New Jersey is one of 33 states to enact advisories to limit fish consumption due to mercury contamination. The advisory applies statewide to two freshwater species, chain pickerel and largemouth bass. Mercury sources include local and regional air emissions from coal-fired power plants and municipal waste incinerators. Through air deposition and bioaccumulation processes, it accumulates in fish. In 1994, the federal Food and Drug Administration issued advice to limit consumption of shark and swordfish due to mercury contamination.

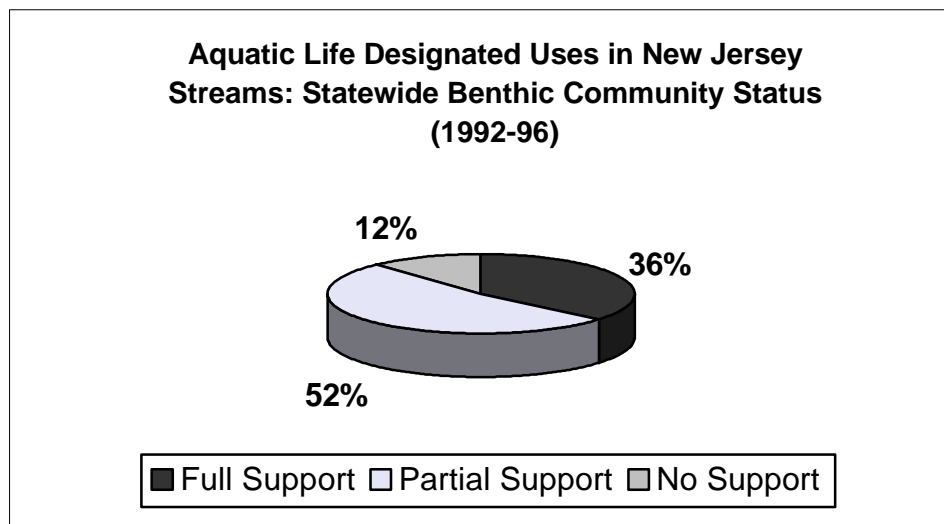
New Jersey's Mercury Task Force has conducted an inventory of mercury sources and is identifying regional and national mercury reduction strategies to reduce mercury from out-of-state sources. Within New Jersey, emissions from municipal waste incinerators, once a significant source of mercury, have been reduced 10 fold between 1993 and 2000.

In the early and mid-1980's, New Jersey issued advisories to limit consumption and sale of several species from northern New Jersey coastal waters and the lower Delaware River and Bay due to chlorinated organics contamination in fish tissue. These chemicals are now primarily released from contaminated sites and nonpoint sources. In addition, fish are mobile animals and may have become contaminated in New Jersey or elsewhere. Although regularly scheduled monitoring data and assessments for levels of toxics in fish tissue are not available, several studies are underway to collect new data on chemical levels in fish. Limited data from the late 1990's indicate that levels of chlorinated organics in fish tissue may be decreasing in some areas, warranting a re-evaluation of these advisories. In addition, several studies are ongoing to track down emissions of chlorinated organics and eliminate or control identified sources.

Are other forms of aquatic life healthy?

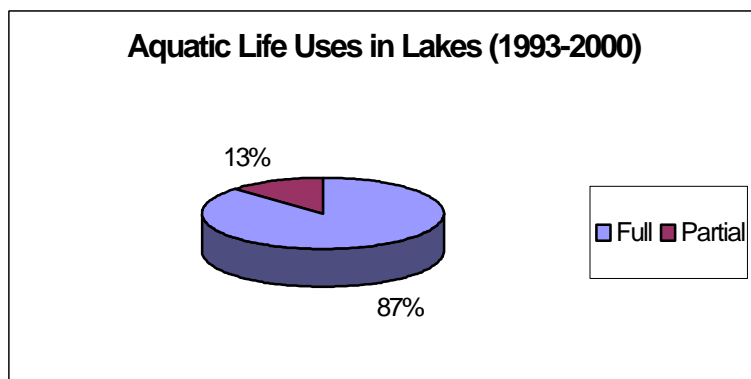
Generally, yes. Aquatic ecosystems consist of the plants, fish, amphibians, insects and other creatures that inhabit a waterbody. These organisms respond to natural and human induced disturbances to the environment in complex ways. It is not possible to monitor all components of the aquatic ecosystem. However, NJDEP operates an extensive program to monitor populations of bottom dwelling (benthic) insect larvae and other small aquatic organisms that indicate the health of riverine aquatic ecosystems.

Based on benthic data collected in rivers in the 1990's, about 35% of monitoring locations are not impaired, 52% are moderately impaired and 12% are severely impaired. These results appear different from the fish population data discussed above, but probably reflect



different responses of fish and benthic organisms to environmental disturbance. Benthic communities are very sensitive to natural and human-induced disturbances to physical habitat. Natural disturbances include drought and floods; human induced disturbances include changes stream flow, erosion, and water and sediment chemistry.

NJDEP has efforts underway to identify the factors that contribute to benthic impairment and to focus watershed restoration projects to reduce impairment. Research has shown that protection of headwaters, riparian forests and wetlands, management of stormwater, and nonpoint sources of pollution as well as continued diligent management of point sources are essential to protecting and restoring aquatic ecosystems.



Aquatic life uses were assessed in lakes for the first time using fish population assessments. Results indicate that 87% of the 9,875 lake acres assessed fully support uses. Of these acres, approximately a third are threatened. Of the remaining lake acreages assessed; 1,290 acres (13%) partially supported aquatic life and 0 acres did not support aquatic life.

Based on available lake trophic status data, many of the assessed New Jersey lakes are eutrophic. Eutrophication is a natural process whereby lakes fill in with sediment and become wetlands. Eutrophic lakes are characterized by significant growth of aquatic plants and can experience depleted dissolved oxygen. Eutrophication is accelerated in many of New Jersey's lakes because they are shallow man-made impoundments and are highly prone to accelerated inputs of nutrients and sediment. The excessive growth of algae and macrophytes can impair the lakes use for swimming and boating. In addition, aquatic life in these lakes may be negatively affected by the episodes of depleted dissolved oxygen and temperature fluctuations which can occur as result of eutrophication.

Projects are being conducted at a number of New Jersey lakes to address lake eutrophication, including dredging, sedimentation reduction, and nutrient management. Over the next several years, additional fish population and benthic data will be collected and assessed to update and improve aquatic life characterizations in lakes.

Dissolved oxygen in water is necessary for almost all aquatic life. Dissolved oxygen (DO) concentration data collected in bays and the ocean were used as an indirect indicator of the health of aquatic ecosystems. In estuaries, 203 of 264 square statute miles (75%) met DO standards in 90% or more of samples and were classified as meeting aquatic life uses; 61 of 264 square statute miles (23%) partially met DO standards and were classified as partially meeting aquatic life uses.

In the ocean, 94 of 446 square statute miles (21%) met DO standards in 90% or more of samples and were classified as fully meeting aquatic life uses. In 354 of 446 square statute miles (79%) met DO standards but transient low DO cells formed in the summer. Low dissolved oxygen can occur naturally due to the actions of wind and temperature, and these natural conditions can be aggravated by nutrient inputs from land and air. Atmospheric nutrient inputs to ocean and estuarine waters are being measured through the Air Deposition Monitoring Network. A nutrient TMDL is being developed for the New York-New Jersey Harbor to manage point and nonpoint source inputs of nutrients.